U.S. FISH AND WILDLIFE SERVICE SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

Scientific Name:

Ranunculus hawaiensis

Common Name:

makou

Lead region:

Region 1 (Pacific Region)

Information current as of:

06/01/2013

Status/Action

___ Funding provided for a proposed rule. Assessment not updated.

___ Species Assessment - determined species did not meet the definition of the endangered or threatened under the Act and, therefore, was not elevated to the Candidate status.

___ New Candidate

_X_ Continuing Candidate

___ Candidate Removal

> ___ Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status
>
> ___ Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species
>
> ___ Range is no longer a U.S. territory
>
> ___ Insufficient information exists on biological vulnerability and threats to support listing
>
> ___ Taxon mistakenly included in past notice of review
>
> ___ Taxon does not meet the definition of "species"
>
> ___ Taxon believed to be extinct
>
> ___ Conservation efforts have removed or reduced threats

___ More abundant than believed, diminished threats, or threats eliminated.

Petition Information

___ Non-Petitioned

_X_ Petitioned - Date petition received: 05/11/2004

90-Day Positive:05/11/2005

12 Month Positive:05/11/2005

Did the Petition request a reclassification? **No**

For Petitioned Candidate species:

Is the listing warranted(if yes, see summary threats below) **Yes**

To Date, has publication of the proposal to list been precluded by other higher priority listing? **Yes**

Explanation of why precluded:

We find that the immediate issuance of a proposed rule and timely promulgation of a final rule for this species has been, for the preceding 12 months, and continues to be, precluded by higher priority listing actions (including candidate species with lower LPNs). During the past 12 months, almost our entire national listing budget has been consumed by work on various listing actions to comply with court orders and court-approved settlement agreements, emergency listings, and essential litigation-related, administrative, and program management functions.

Historical States/Territories/Countries of Occurrence:

- **States/US Territories**: Hawaii
- **US Counties**: Hawaii, HI, Maui, HI
- **Countries**: United States

Current States/Counties/Territories/Countries of Occurrence:

- **States/US Territories**: Hawaii
- **US Counties**: Hawaii, HI, Maui, HI
- **Countries**:Country information not available

Land Ownership:

Ranunculus hawaiensis is known from six populations: three populations on State land (Mauna Kea and Kapapala Forest Reserves (FR) on the island of Hawaii); two populations on Federal land (Hawaii Volcanoes National Park and Hakalau NWR on the island of Hawaii); and one population on state land on Maui (Waikamoi Preserve).

Lead Region Contact:

ARD-ECOL SVCS, Jesse D'Elia, 5032312349, jesse_delia@fws.gov

Lead Field Office Contact:

PACIFIC ISLANDS FISH AND WILDL OFC, Kristi Young, 503 231-6845, kristi_young@fws.gov

Biological Information

Species Description:

Ranunculus hawaiensis is an erect or ascending perennial herb 20 to 79 inches (in) (50 to 200 centimeters (cm)) tall with fibrous roots. Stems are densely covered with golden or whitish hairs. Basal leaves are twice compound, with leaflets lanceolate with the terminal one largest and irregularly toothed and lobed. The yellow, glossy flowers are numerous in branched open cymes and contain a scale-covered nectary at the base. Achenes are numerous in an ovoid head and are margined with a narrow wing (Wagner et al. 1999, p. 1,088).

Taxonomy:

Ranunculus hawaiensis was described by Asa Gray (1854). This species is recognized as a distinct taxon in Wagner et al. (1999, p. 1,088), the most recently accepted Hawaiian plant taxonomy.

Habitat/Life History:

Typical habitat is mesic to wet forest dominated by *Metrosideros polymorpha* (ohia) and *Acacia koa* (koa) with scree substrate at elevations between 6,000 and 6,700 feet (ft) (1,820 and 2,040 meters (m)) (Medeiros 2007, pers. comm.; Pratt, in litt. 2007; Wagner et al. 1999, p. 1,088).

Historical Range/Distribution:

Historically, *Ranunculus hawaiensis* was wide-ranging on the island of Hawaii, from Kona, Hualalai, Mauna Kea, and Kau. On Maui, this species was known from Haleakala National Park (Hawaii Biodiversity Mapping Program (HBMP) 2008).

Current Range Distribution:

Ranunculus hawaiensis is found on the island of Hawaii on unencumbered State land adjacent to Kipahoehoe Natural Area Reserve (NAR), in Hawaii Volcanoes National Park Kahuku section, at Kapapala FR, and Mauna Kea FR at Puu Kanakaleonui and north Kolekole Gulch. On Maui, this species is known from one sighting on a cliff in the Waikamoi Preserve (Bio, in litt. 2008; Pratt, in litt. 2008; Oppenheimer, in litt. 2006; Agorastos, in litt. 2011).

Population Estimates/Status:

In the 1980s and 1990s, *Ranunculus hawaiensis* numbered several hundred individuals on both Maui and the island of Hawaii. Currently, there are six populations totaling 14 individuals on the island of Hawaii. On the island of Hawaii there are 2 individuals on State land above Hakalau National Wildlife Refuge (NWR), 1 to 3 fenced-enclosed individuals at Puu Kanakaleonui in Hakalau NWR (last observed in 2005), 1 individual at Kolekole gulch, 6 individuals on Federal land at Kahuku (part of Hawaii Volcanoes National Park), 1 individual at Kapapala FR on State Land, and 1 individual on unencumbered State land adjacent to Kipahoehoe NAR (HBMP 2008; Bio, in litt. 2008; Pratt, in litt. 2008; Plant Extinction Prevention Program (PEPP) 2008, p. 108; Agorastos, in litt. 2011; Imoto, in litt. 2013). The 8 individuals previously reported at Kapapala FR (also referenced as Kau FR and Kahuku) are now down to 1 individual and this population remains threatened by feral cattle and drought (Pratt, in litt. 2011; Imoto, in litt. 2013). Five individuals were

outplanted at Kahuku, on the island of Hawaii in 2007 (Pratt, in litt. 2007); however, Pratt (in litt. 2011) confirmed these as dead in 2010. On Maui, the last observation was in 1995 of a few individuals on a cliff in the Waikamoi Preserve (Oppenheimer, in litt. 2007), and as of 2012, the status of this population remains uncertain (PEPP, in litt. 2012). None were found on a survey of Kuiki planeze in Haleakala National Park in 2006; however, the area will be surveyed again (DLNR 2006).

Threats

A. The present or threatened destruction, modification, or curtailment of its habitat or range:

Ranunculus hawaiensis is threatened by feral pigs (*Sus scrofa*) and goats (*Capra hircus*) on both islands, by feral sheep (*Ovis aries*) and mouflon (*Ovis musimon*) on Hawaii, and by feral cattle (*Bos taurus*) on Maui (Medieros in litt. 1996 and 1997; Pratt, in litt. 2007). All of these ungulates are known to degrade and destroy habitat (Hawaii Biodiversity and Mapping Program (HBMP) 2008). Evidence of the activities of feral pigs, goats, sheep, mouflon and cattle has been reported in areas where R. hawaiensis is known to occur (Medeiros, in litt. 1995; Pratt, in litt. 2007; Agorastos 2007, pers. comm.).

Pigs of Asian ancestry were introduced to Hawaii by the Polynesians, and the Eurasian type was introduced to Hawaii by Captain James Cook in 1778, with many other introductions thereafter (Tomich 1986). Some pigs raised as food escaped into the forests of Hawaii, Kauai, Oahu, Molokai, Maui, and Niihau, and are now managed as a game animal by the State to optimize hunting opportunities (Tomich 1986; State of Hawaii 2001). In a study conducted in the 1980s on feral pig populations in the Kipahulu Valley on Maui, the deleterious effects of feral pig rooting on native forest ecosystems was documented (Diong 1982). Kipahulu Valley consists of a diverse composition of native ecosystems, from near sea level to alpine, and forest types ranging from mesic to wet, *Acacia koa* (koa) and/or *Metrosideros polymorpha* (ohia). Rooting by feral pigs was observed to be related to the search for earthworms, with rooting depths averaging 8 inches (20 centimeters) greatly disrupting the leaf litter and topsoil layers and contributing to erosion and changes in ground topography. The feeding habits of pigs were observed to create seed beds, enabling the establishment and spread of weedy species such as *Psidium cattleianum* (strawberry guava). The study concluded that all aspects of the food habits of pigs are damaging to the structure and function of the Hawaiian forest ecosystem (Diong 1982).

The goat, a species originally native to the Middle East and India, was successfully introduced to the Hawaiian Islands in 1792. Currently, populations exist on Kauai, Oahu, Maui, Molokai, and Hawaii. Goats browse on introduced grasses and native plants, trample roots and seedlings, cause erosion, and promote the invasion of alien plants. Goats are able to forage in extremely rugged terrain and have a high reproductive capacity (Clarke and Cuddihy 1980; van Riper and van Riper 1982; Scott et al. 1986; Tomich 1986; Culliney 1988; Cuddihy and Stone 1990). A study of goat predation on the native *A. koa* forest on the island of Hawaii has shown that grazing pressure by goats can cause the eventual extinction of *A. koa* because it is unable to reproduce (Spatz and Mueller-Dombois 1973). An exclosure analysis demonstrated that release from goat pressure by fencing resulted in an immediate recovery in height growth and numbers of vegetative resprouts of *A. koa* (Spatz and Mueller-Dombois 1973). Another study at Puuwaawaa on the island of Hawaii demonstrated that prior to management actions in 1985, regeneration of endemic shrubs and trees in the grazed area was almost totally lacking, contributing to the invasion of the forest understory by exotic grasses and weeds. After the removal of grazing animals in 1985, *A. koa* and *Metrosideros* spp. (ohia) seedlings were observed geminating by the thousands (Department of Land and Natural Resources (DLNR) 2002).

Sheep have become established on the island of Hawaii (Tomich 1986) since their introduction almost 200 years ago (Cuddihy and Stone 1990). Sheep roam the upper elevation dry forests of Mauna Kea, Mauna Loa,

and Hualalai (above 3,300 ft (1,000 m)), causing damage similar to that of goats (Stone 1985). Sheep have decimated vast areas of native forest and shrubland on Mauna Kea and continue to do so as a managed game species (Stone 1985; Cuddihy and Stone 1990).

The European mouflon is a native of Corsica and Sardinia (Clark 1964). They are currently established on the islands of Lanai and Hawaii (Giffin 1982; Pacific Island Ecosystems at Risk (PIER) 2007). Most are found at higher elevations on Mauna Kea where they were released between 1962 and1966, but they are also known from Kahuku Ranch on the southern slopes of Mauna Loa. Feral sheep-mouflon hybrids are known where range overlaps between the two occur (Giffin 1982). Mouflon sheep are both grazers and browsers. In range studies done on the effects of mouflon grazing and browsing, plant species found to be most affected by sheep were *Geranium* sp. (hinahina), *Sophora chrysophylla* (mamane), *Vaccinium* sp. (ohelo), and native grasses (Giffin 1982; Scowcroft and Conrad 1992).

Cattle, the wild progenitors of which were native to Europe, northern Africa, and southwestern Asia, were introduced to the Hawaiian Islands in 1793. Large feral herds developed as a result of restrictions on killing cattle decreed by King Kamehameha I. While small cattle ranches were developed on Kauai, Oahu, and west Maui, very large ranches of tens of thousands of acres were created on east Maui and Hawaii. Feral cattle can presently be found on the islands of Hawaii and Maui, and ranching is still a major commercial activity. Cattle eat native vegetation, trample roots and seedlings, cause erosion, create disturbed areas into which alien plants invade, and spread seeds of alien plants in their feces and on their bodies. The forest in areas grazed by cattle becomes degraded to grassland pasture, and plant cover is reduced for many years following removal of cattle from an area. Several alien grasses and legumes purposely introduced for cattle forage have become noxious weeds (Tomich 1986; Cuddihy and Stone 1990).

Hawaiian ecosystems, having evolved without disturbance of hoofed mammals, are susceptible to large-scale disturbance by pigs, goats, and other introduced ungulates (Loope et al. 1991). Because of demonstrated habitat modifications by feral pigs, goats, sheep, mouflon, and cattle, such as destruction of native plants, disruption of topsoil leading to erosion, and establishment and spread of nonnative plants; the U.S. Fish and Wildlife Service (FWS) believes they are all threats to *R. hawaiensis*.

B. Overutilization for commercial, recreational, scientific, or educational purposes:

None known.

C. Disease or predation:

Ranunculus hawaiensis is threatened by predation by feral pigs and goats on both islands, by feral sheep and mouflon on Hawaii, and by feral cattle on Maui (Medieros, in litt. 1996 and 1997; Pratt, in litt. 2007; PEPP 2008, p. 108). Browsing by ungulates has been observed on many native plant species, including common and rare or endangered species (Cuddihy and Stone 1990; Loope et al. 1991). Browsing has been observed on *R. hawaiensis* at the Kapapala FR population (PEPP 2008, p. 108). Because Hawaiis native plants evolved without any browsing or grazing mammals present, many lost natural defenses to such impacts (Carlquist 1980).

Pigs are omnivorous in their diet. In the study described above on feral pig populations in the Kipahulu Valley, pigs were observed browsing on young shoots, leaves and fronds of a wide variety plants, of which over 85 percent were endemic species (Diong 1982). A stomach content analysis showed that the pigs food sources consisted of native plants, 60 percent of which was *Cibotium* spp. (tree ferns), alternating with *Psidium cattleianum* (strawberry guava) when it was available. Pigs were observed felling and removing the bark of *Clermontia*, *Cibotium*, *Coprosma*, *Psychotria*, and *Hedyotis* species (herbaceous and woody plants), and causing enough damage to kill larger trees over a few months of repeated feeding. Direct damage to *R. hawaiensis* by pigs has been observed on the island of Hawaii (Warshauer, in litt. 1997).

Predation by goats is a potential threat where populations of *R. hawaiensis* occur on State lands (Agorastos 2007, pers. comm.; Jacobs 2007, pers. comm.). Feral goats eat native vegetation, are able to forage in extremely rugged terrain, and have a high reproductive capacity. Elimination of rare native plants such as *Argyroxiphium kauense* and *A. sandwicense* ssp. *sandwicense* (Hawaiian silverswords), *Canavalia kauensis* (awikiwiki), and a number of Maui species (*Plantago princeps*, *Schiedea haleakalaensis*, *Stenogyne microphylla*), from areas heavily foraged by goats has been documented (Cuddihy and Stone 1990).

Feral sheep and mouflon are known to browse numerous native plant species including: *Chenopodium oahuense*, *Coprosma* sp., *Dubautia* sp., *Geranium* sp., *Leptecophylla* tameiameiae, *Myoporum sandwicense*, *Sophora chrysophylla*, *Vaccinium* sp., and native grasses (Giffin 1976, 1982; Scowcroft and Conrad 1992). Therefore, it is likely that feral sheep and mouflon impact this species directly as well as the surrounding habitat.

Slugs are generalist herbivores (Rathke 1985) that feed principally on plant seedlings and low-lying herbs, yet they are not completely indiscriminate in their choices of foods (Dirzo 1980; Joe 2006). While native Hawaiian plants have had to defend themselves against avian, insect and possibly snail herbivory, the defense mechanisms evolved by Hawaiian plants may not be very effective against introduced slugs (Joe 2006). In the Kahanahaiki Management Unit on Oahu, slugs were found to be responsible for substantial seedling mortality of certain native plant species. Of three native species studied, two had significantly higher seedling mortality (50 percent) when exposed to slugs (Joe 2006). Slug damage has been observed on *R. hawaiensis* in cultivation and in the wild (Medeiros 2007, pers. comm.). The effect of slugs on the decline of this and related species is unclear, although slugs may pose a threat by feeding on the stems and fruit thereby reducing the vigor of the plants and limiting regeneration (Mehrhoff, in litt. 1994). Currently, there is no known control method for this threat.

As of May 2013, we do not have information to indicate that disease poses a threat to *R. hawaiensis*.

D. The inadequacy of existing regulatory mechanisms:

Ranunculus hawaiensis is not currently protected under Hawaiis endangered species law (HRS, Sect. 195-D) or the Federal Endangered Species Act (16 U.S.C. §1531-1544).

Pigs, goats, sheep and mouflon are managed in Hawaii as game animals, but many populate inaccessible areas where hunting is difficult, if not impossible, and therefore has little effect on their numbers (Hawaii Heritage Program 1990). Pig, goat, sheep and mouflon hunting is allowed year-round, or during certain months, depending on the area (Hawaii DLNR 1999, 2003); however, public hunting does not adequately control the number of ungulates to eliminate this threat to native plant species. Hunting of feral cattle is no longer allowed in Hawaii (Hawaii DLNR 1985) except under permitted conditions.

E. Other natural or manmade factors affecting its continued existence:

Ranunculus hawaiensis is threatened by introduced pasture grasses that degrade and destroy habitat and outcompete native plants (HBMP 2008). The nonnative grasses that are reported to be the greatest threats to *R. hawaiensis* on the island of Hawaii are *Anthoxanthum odoratum* (sweet vernalgrass), *Ehrharta stipoides* (meadow rice grass), *Holcus lantanus* (common velvet grass) , and *Pennisetum clandestinum* (kikuyu grass) (HBMP 2008; PEPP 2008, p. 108). Nonnative plants which pose the greatest threats to *R. hawaiensis* on the island of Maui are: *Cymbopogon refractus* (barbwire grass), *H. lantanus*, and *P.clandestinum* (Medieros, in litt. 1995).

Anthoxanthum odoratum, a grass native to Eurasia, is naturalized on Molokai, Maui, Kauai, and Hawaii (Wagner et al. 1999, p. 1,498). This grass forms extensive ground cover in disturbed areas and prevents

reestablishment of native species. Seeds are dispersed by wind, water, and animals. The Hawaii Weed Risk Assessment Protocol places this species in the high risk category (PIER 2009). We are unaware of any control methods for this species.

Cymbopogon refractus is native to Australia and in Hawaii is naturalized and common in pastures, along roadsides, and in dry, disturbed sites, from sea level to 3,640 ft (0 to 1,110 m) elevation (Wagner et al. 1999; PIER 2006a). We are unaware of any control methods for this species.

Ehrharta stipoides is a grass which drastically alters environments by creating a thick mat in which other species cannot regenerate. The seeds are easily dispersed by awns that attach to fur or clothing (U.S. Army 2006; PIER 2006b). We are unaware of any control methods for this species.

Holcus lanatus, native to Europe, is naturalized in Hawaii and occurs on poor, moist soils. *H. lanatus* is an aggressive weed, growing rapidly from basal shoots or prolific seed and therefore can become dominant if not controlled. *H. lanatus* gradually forces other plants out, reducing species diversity. Allelopathy may also play a role in the dominance of this species over other species (Remison and Snaydon 1980). The most effective control measure is physical removal by hand pulling or hoeing. No effective means of biocontrol have been found (The Nature Conservancy 2005).

Pennisetum clandestinum is native to tropical eastern Africa, and is found on all major Hawaiian Islands from 1,640 to 6,560 ft (500 to 2,000 m) in dry and mesic habitats. It invades wet environments when the forest is disturbed (Smith 1985). Kikuyu grass is one of the most serious pest species threatening native vegetation; its smothering, thick, dense growth prevents virtually any new seedling establishment (Wagner et al. 1999; Holm et al. 1977). We are unaware of any control methods for this species beyond herbicide application (University of Hawaii 2013).

The original native flora of Hawaii consisted of about 1,400 species, nearly 90 percent of which were endemic. Of the current total native and naturalized Hawaiian flora of 1,817 taxa, 47 percent are introduced species, and nearly 100 of those species are considered pests (Smith 1985; Wagner et al. 1999). Confirmed personal observations (HBMP 2008) and several studies (Cuddihy and Stone 1990; Wood and Perlman 1997; Robichaux et al. 1998, p. 4) indicate nonnative plant species may outcompete native plants similar to *R. hawaiensis*. Competition may be for space, light, water, or nutrients, or there may be a chemical produced that inhibits growth of other plants (Smith 1985; Cuddihy and Stone 1990). In addition, nonnative pest plants found in habitat similar to that of this species have been shown to make the habitat less suitable for native species (Smathers and Gardner 1978; Smith 1985; Loope and Medeiros 1992; Medeiros et al. 1992; Ellshoff et al. 1995; Meyer and Florence 1996; Medeiros et al. 1997; Loope et al. 2004). In particular, alien pest plant species degrade habitat by modifying availability of light, altering soil-water regimes, modifying nutrient cycling, or altering fire characteristics of native plant communities (Smith 1985; Cuddihy and Stone 1990; Vitousek et al. 1997). Currently, many widespread alien plant taxa cannot be completely eradicated from the islands of Maui and Kauai, and therefore are expected to continue dispersing into managed areas (Loope 1998; Smith 1985). Because of demonstrated habitat modification and resource competition by nonnative plant species in habitat similar to that of *R. hawaiensis* the FWS believes nonnative plant species are a threat to this species.

Conservation Measures Planned or Implemented :

Three populations have been outplanted into protected exclosures at Hakalau Forest NWR (5 to10 individuals), Mauna Kea FR (8 individuals), and in the Kahuku portion of Hawaii Volcanoes National Park (5 individuals). Nonnative plants are also being controlled within the exclosures (Belfield 2007, pers. comm.; Pratt 2007, pers. comm.; Agorastos 2007, pers. comm.; Jeffrey 2007, in litt.; Moriyasu 2009, in litt.).

This species is represented in ex situ collections at the Volcano Rare Plant Facility (2 individuals) and at Hakalau Forest NWR (FWS 2005; Jeffrey, in litt. 2007; Moriyasu, in litt. 2009; Conry, in litt. 2012).

Approximately 50 seeds from Mauna Kea are in storage at the Lyon Arboretum Seed lab (Conry, in litt. 2012; Imoto, in litt. 2013).

Summary of Threats :

Based on our evaluation of habitat degradation and loss by feral pigs, goats, sheep, mouflon, and cattle, and by competition with nonnative plants, we conclude there is sufficient information to develop a proposed rule for this species due to the present and threatened destruction, modification, or curtailment of its habitat and range, and the displacement of individuals of *Ranunculus hawaiensis* due to competition with nonnative plants for space, nutrients, water, and light. Predation by feral pigs, goats, sheep, mouflon, cattle, and slugs is a potential threat to *R. hawaiensis*. We find that this species is warranted for listing throughout all its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

_____ Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions(PECE)?

Recommended Conservation Measures :

- Protect all individuals from feral pigs, goats, sheep, mouflon, and cattle by removing these species from areas where *Ranunculus hawaiensis* populations exist and preventing reinvasion through the use of exclosures.
- Control alien plants through physical, mechanical, and biological control methods, as well as herbicides when necessary. Continue to conduct research into potential biocontrol species.
- Develop and implement control methods for slugs.
- Conduct/update field surveys at known locations and potential habitat.
- Reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species.
- Propagate and maintain genetic stock.

Priority Table

Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	**2**
		Subspecies/Population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/Population	6
Moderate to Low	Imminent	Monotype genus	7
		Species	8
		Subspecies/Population	9
	Non-Imminent	Monotype genus	10
		Species	11
		Subspecies/Population	12

Rationale for Change in Listing Priority Number:

Magnitude:

This species is highly threatened by feral pigs, goats, sheep, mouflon, and cattle that degrade and destroy habitat, and by nonnative plants that outcompete and displace it. This species is potentially threatened by predation by these nonnative animals. Threats to the mesic to wet forest habitat of *Ranunculus hawaiensis*, and to individuals of this species, occur throughout its range and are expected to continue or increase without their control or eradication. Only 18 to24 plants are currently protected from ungulates (Pratt, in litt. 2007; Jeffrey, in litt. 2007; Moriyasu 2007, pers. comm.; Agorastos 2007, pers. comm.).

Imminence :

Habitat degradation by feral pigs, goats, sheep, mouflon and cattle, and competition with nonnative plants are imminent threats because they are ongoing. Possible predation by slugs is considered nonimminent.

__Yes__ Have you promptly reviewed all of the information received regarding the species for the purpose of determination whether emergency listing is needed?

Emergency Listing Review

__No__ Is Emergency Listing Warranted?

The species does not appear to be appropriate for emergency listing at this time because the immediacy of the threats is not so great as to imperil a significant proportion of the taxon within the time frame of the routine listing process. In addition, individuals of *Ranunculus hawaiensis* will benefit from conservation actions in weed and ungulate-free areas on the island of Hawaii. This species is represented in ex situ collections. If it becomes apparent that the routine listing process is not sufficient to prevent large losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of *R. hawaiensis* as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

Description of Monitoring:

Much of the information on this form is based on the results of two meetings of 20 botanical experts held by the Center for Plant Conservation in December of 1995 and November 1996, and was updated by personal communication with Arthur Medeiros of the U.S.Geological Survey- Biological Resources Discipline (USGS-BRD) in 1999. We have incorporated additional information on this species from our files and the most recent supplement to the Manual of Flowering Plants of Hawaii (Wagner and Herbst 2003). New status and range information was provided in 2007 by Linda Pratt and Arthur Medeiros, USGS-BRD; Jack Jeffrey, FWS; Thomas Belfield, National Park Service; Patrice Moriyasu, Volcano Rare Plant facility; Jefferson Jacobs, U.S. Army Environmental Pohakuloa Training Area; and Nick Agorastos, Hawaii Division of Forestry and Wildlife (DOFAW). In 2008, new information was provided by Linda Pratt, USGS-BRD and Kealii Bio, PEPP. In 2009 we received new information from Patrice Moriyasu, Volcano Rare Plant Facility. In 2010, we received no new information. In 2011, we contacted the species experts listed below and received new information from Nick Agorastos of Hawaii DOFAW and Linda Pratt of USGS-BRD. In 2012 and 2013, we received information from the State and incorporated it into this form.

List all experts contacted in 2011:

Name Date Affiliation
Agorastos, Nick 02/16/11 Division of Forestry and Wildlife, Hawaii
Bakutis, Ane 02/16/11 Plant Extinction Prevention Program, Molokai
Ball, Donna 02/16/11 U.S. FWS, Partners Program, Hawaii
Bily, Pat 02/16/11 The Nature Conservancy, Maui
Bio, Kealii 02/16/11 Plant Extinction Prevention Program, Hawaii
Caraway, Vickie 02/22/11 Hawaii Division of Forestry and Wildlife, Oahu
Ching, Susan 02/16/11 Plant Extinction Prevention Program, Oahu
Clark, Michelle 02/16/11 U.S. FWS, Partners Program, Kauai
Duvall, Fern 02/16/11 Hawaii Division of Forestry and Wildlife, Maui
Fay, Kerri 02/16/11 The Nature Conservancy, Maui
Garnett, Bill 02/16/11 National Park Service, Kalaupapa, Molokai
Haus, Bill 02/16/11 National Park Service, Haleakala NP, Maui
Higashino, Jennifer 02/16/11 U.S. FWS, Partners Program, Maui
Imada, Clyde 02/16/11 Bishop Museum, Botany Department
Kawelo, Kapua 02/16/11 U.S. Army, Environmental Division
McDowell, Wendy 02/16/11 Plant Extinction Prevention Program, Kauai
Medeiros, Arthur 02/16/11 U.S. Geological Survey
Moses, Wailana 02/16/11 The Nature Conservancy, Molokai
Oppenheimer, Hank 02/16/11 Plant Extinction Prevention Program, Maui Nui
Perlman, Steve 02/16/11 National Tropical Botanical Garden
Perry, Lyman 02/16/11 Division of Forestry and Wildlife, Hawaii
Pratt, Linda 02/16/11 U.S. Geological Survey, Biological Resources Division
Starr, Forest 02/16/11 U.S. Geological Survey
Stevens, Bryon 02/16/11 DLNR Natural Area Reserves, Maui
Ward, Joe 02/22/11 Puu Kukui Watershed Preserve
Welton, Patti 02/16/11 National Park Service, Haleakala NP, Maui
Wysong, Michael 02/16/11 DLNR Natural Area Reserves, Kauai

The Hawaii Biodiversity and Mapping Program identified this species as critically imperiled (HBMP 2006). Based on the International Union for Conservation of Nature and Natural Resources Red List of Threatened Species, this species is recognized as Endangered (facing a very high risk of extinction in the wild) (Bruegmann and Caraway 2003). *Ranunculus hawaiensis* is included in the list of species in Hawaiis 2005 Comprehensive Wildlife Conservation Strategy (Mitchell et al. 2005).

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment:

Hawaii

Indicate which State(s) did not provide any information or comment:

none

State Coordination:

On February 20, 2013, we provided the Hawaii Division of Forestry and Wildlife with copies of our most recent candidate assessments for their review and comment. New information was received from the State on March 23 and April 12, 2013, and incorporated into this report.

Literature Cited:

Bruegmann, M.M., and V. Caraway. 2003. *Ranunculus hawaiensis*. In IUCN 2006 Red List of Threatened Species, http://www.iucn.redlist.org, accessed on December 18, 2006.

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Approval/Concurrence:

Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve:  06/13/2013
Date

Concur:  10/28/2013
Date

Did not concur: _____ _____
Date

Director's Remarks: